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Schizophrenia and Dissociative Identity Disorder: A Theoretical Investigation and Discussion of Dissociative Processes in Schizophrenic Patients with a History of Childhood Adversities.

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Abstract

Research indicates that childhood adversities, which are recognized as an etiological factor in dissociative identity disorder (DID), also are prevalent in patients with schizophrenia. Early descriptions of schizophrenia resemble definitions and descriptions of dissociation, a cardinal feature of DID. Dissociation is defined as a lack of integration of personality due to traumatic experiences in childhood. This theoretical paper investigates dissociative processes in schizophrenic patients with a history of childhood adversities. Relevant literature on DID and schizophrenia is reviewed. It is discussed whether positive symptoms, memory impairments, and disordered self-experience in schizophrenic patients can be understood as dissociative processes. Similarities in neurobiological alterations between schizophrenic patients and people exposed to childhood adversities support the assumption of dissociative processes in the pathology and symptom expression of schizophrenia. A dissociative subtype of schizophrenia has been suggested. The paper advocates a need for the consideration of dissociative processes as a consequence of childhood adversities in schizophrenia. Implications for treatment are discussed.

Keywords: dissociation, schizophrenia, dissociative identity disorder, childhood adversities, dissociative processes

Sammendrag

Forskning viser at forekomsten av barndomstraumer, som er en anerkjent årsaksfaktor i dissosiativ identitetsforstyrrelse (DID), også er utbredt blant pasienter med schizofreni. Tidlige beskrivelser av schizofreni ligner definisjoner og beskrivelser av dissosiasjon, et sentralt symptom i DID. Dissosiasjon defineres som manglende integrering av personligheten som følge av traumatiske hendelser i barndommen. Med utgangspunkt i relevant litteratur om DID og schizofreni er formålet med oppgaven å undersøke dissosiative prosesser hos schizofrene pasienter som har opplevd barndomstraumer. Det diskuteres hvorvidt positive symptomer, hukommelsesvansker og forstyrrelser i selvopplevelse hos schizofrene pasienter kan forstås som dissosiative prosesser. Antakelsen om underliggende dissosiative prosesser i patologi og symptomuttrykk i schizofreni støttes av likheter i nevrobiologiske endringer hos schizofrene pasienter og mennesker som har vært utsatt for barndomstraumer. En dissosiativ subtype av schizofreni er foreslått. Oppgaven argumenterer for at man bør vurdere hvorvidt dissosiative prosesser, utviklet som en konsekvens av barndomstraumer, er tilstede hos schizofrene pasienter. Kliniske implikasjoner drøftes.

Nøkkelord: dissosiasjon, schizofreni, dissosiativ identitetsforstyrrelse, barndomstraumer, dissosiative prosesser

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Introduction

In June 2015, the first international conference addressing the relationship between trauma, dissociation and psychosis was held in Kristiansand, Norway, marking an important step towards integrating knowledge and research on psychosis and dissociation (Trauma, Dissociation and Psychosis International Conference, 2015). During later years, clinical experience and research on dissociative and psychotic disorders have generated important knowledge regarding the role of childhood adversities in the development of psychopathology.

Theory and clinical practice on dissociative disorders are inspired by the works of Pierre Janet (as cited in Renard, Pijnenborg, & Lysaker, 2012). Janet (as cited in Nijenhuis & van der Hart, 2011) perceived the phenomenon of dissociation as a lack of integration of personality due to traumatic experiences in childhood, often related to primary caregivers. This lack of integration is thought to result in two or more non-integrated dissociative parts of the personality (Nijenhuis & van der Hart, 2011).

Dissociative disorders are characterized in DSM-V “by a disruption of and/or discontinuity in the normal integration of consciousness, memory, identity, emotion, perception, body representation, motor control, and behavior” (American Psychiatric Association, 2013, p. 291). Dissociative symptoms are interpreted in terms of a trauma-dissociation paradigm, and the symptoms are understood as an expression of unresolved trauma (Moskowitz, 2011).

Among the dissociative disorders, dissociative identity disorder (DID) is considered to be the most complex and severe (Nijenhuis, van der Hart, & Steele, 2006). Research on the prevalence of DID is limited (Dorahy et al., 2014). Studies conducted in Turkey have found an estimated prevalence of 0.4 % in the general

population (Akyüz, Doğan, Şar, Yargıç, & Tutkun, 1999) and 1.1 % among women (Akyuz, Sar, Kugu, & Doğan, 2005; Şar, Akyüz, & Doğan, 2007). In a more recent overview, Dorahy et al. (2014) found an estimated prevalence of approximately 1 % in the general population.

Childhood adversities are highly associated with dissociative disorders in general, and DID in particular (Foote, Smolin, Kaplan, Legatt, & Lipschitz, 2006; Mulder, Beautrais, Joyce, & Fergusson, 1998; Ross et al., 1990; Sar et al., 2009; Schauer & Elbert, 2010; Simeon, Guralnik, Schmeidler, Sirof, & Knutelska, 2001; van Ijzendoorn & Schuengel, 1996; Yanartas et al., 2015). Traumatic events in childhood are thought to influence and shape the content and expression of symptoms experienced by patients with DID (Moskowitz, 2011). Traumatic events related to caregivers undermine the development of the mental and relational capacity a child needs to regulate stress and emotion (Gergely, Fonagy, Jurist, & Target, 2002). Dissociation may occur as a result of early and repeated traumatization, when the experience is too painful or intimidating to be encoded and integrated into personality (Liotti, 2004). This may result in dissociative fragmentation (Blizard, 2003; van der Hart, Nijenhuis, & Steele, 2006), disrupting the individual's further interpretation and understanding of themselves and others (Benum, 2006).

An impossible situation arises when the child is exposed to adversities from primary caregivers; the child both lacks the ability to escape, and misses the opportunity for preparation. This can be understood in terms of attachment theory (Bowlby, 1969); the attachment person represents both a secure base and a source of threat. This is assumed to give rise to a *disorganized attachment system* (Liotti & Gumley, 2008; Main, 1991). In some cases, the child psychologically detaches itself from the events

that are too overwhelming to process (Benum, 2006; van der Hart et al., 2006), and reduces its conscious awareness during the traumatic incident (Longden, Madill, & Waterman, 2012). This detachment may involve depersonalization, derealization, identity confusion, and psychogenic amnesia as survival strategies (Longden et al., 2012).

Dissociation is an equivocal concept and there has been, and still are, some controversies surrounding the phenomenon (Dalenberg et al., 2012; Dorahy et al., 2014; Floris & McPherson, 2015). Despite controversies and debate surrounding the validity, prevalence, and etiology of DID as a diagnosis, research that support the diagnosis is accumulating (Dorahy et al., 2014).

Among the psychotic disorders, schizophrenia is the most prevalent one, and also considered to be the most severe (Viertiö, 2011). It is estimated that schizophrenia occurs in 4.6 per 1000 person (Saha, Chant, Welham, & McGrath, 2005). The lifetime risk of developing schizophrenia is estimated to be between 0.3 and 1 % (Norsk Helseinformatikk, 2013).

Schizophrenia was originally described by Bleuler, who defined schizophrenia as a personality that has lost its unity (as cited in Moskowitz, 2011). He also recognized the symptoms of schizophrenia as phenomenologically connected to the life experiences of the patient. According to Bleuler, the fundamental symptoms of schizophrenia consisted of loosening of associations, ambivalence, autism, and flattened or inappropriate affectivity (as cited in Schäfer, Ross, & Read, 2008). Bleuler's view of schizophrenia was premeated with dissociative concepts (Moskowitz, 2011), and in his original description of the disorder, he "repeatedly refers to a splitting of the personality, switching of executive control, amnesia between personality states, conflict

between personality states, different ego states with different names and ages, and changes in voice, facial expression, manner and cognition which matches the different ages and genders of the personality stages” (Ross & Keyes, 2004, p. 70). This historical description of schizophrenia resembles contemporary descriptions of dissociative disorders (Moskowitz, 2011), and has common features with the DSM-V description of dissociation previously cited (Renard et al., 2012).

Throughout the 20th century, the field of schizophrenia has largely been influenced by the works of Kraepelin, who viewed schizophrenia as a biological and genetic malfunction (Moskowitz, 2011). There has been less focus on psychosocial factors in the development of schizophrenia, such as adverse childhood experiences (Moskowitz, 2011).

Recent research has shown that many patients diagnosed with schizophrenia have experienced childhood adversities (Bendall, Jackson, Hulbert, & McGorry, 2008; Ross & Keyes, 2004; Sar et al., 2009; Schalinski, Fischer, & Rockstroh, 2015; Spence et al., 2006), and dissociative phenomena appear to be present in many schizophrenic patients (Ross & Keyes, 2004; Schäfer et al., 2008; Vogel, Braungardt, Grabe, Schneider, & Klauer, 2013). This has led to the proposal of dissociation mediating the relationship between childhood trauma and psychosis (Moskowitz, 2011). A dissociative subtype of schizophrenia has been suggested to explain the prevalence of childhood adversities and dissociative phenomena in some schizophrenic patients (Ross, 2004).

A growing body of research indicates that symptoms characteristic of schizophrenia, such as auditory hallucinations (Read, Os, Morrison, & Ross, 2005), thought disorder and negative symptoms (Morrison, Frame, & Larkin, 2003; Read et al.,

2005), delusions (Read et al., 2005), and disrupted self-concept (Evans, Reid, Preston, Palmier-Claus, & Sellwood, 2015), also appear in patients with dissociative disorders.

Childhood adversities appear to be of considerable importance for the development of different types of psychopathology (Morgan & Fisher, 2007; Muenzenmaier et al., 2015), and are established as an etiological factor in dissociative disorders (Yanartas et al., 2015). There is also increasing evidence indicating that childhood adversities contribute in the etiology of schizophrenia (Read et al., 2005). Physical and sexual abuse (Muenzenmaier et al., 2015; Sar et al., 2009), and emotional neglect (Sar et al., 2009) are among the childhood adversities that have been found to be of importance in both dissociative disorders and schizophrenia. Neurobiological research adds support to the hypothesis that childhood adversities are of importance in the development of both DID and schizophrenia (Read, Fosse, Moskowitz, & Perry, 2014). Neurobiological similarities between persons exposed to early trauma and schizophrenic patients include over-reactivity and dysregulation of the hypothalamic-pituitary-adrenal (HPA) axis, neurotransmitter abnormalities, and structural changes in the brain (Morgan & Fisher, 2007; Read et al., 2014; Read et al., 2005).

Increasing research suggest that a significant proportion of patients with schizophrenia has a history of childhood adversities. Childhood adversities are a central causal factor in DID, in which dissociation can be viewed as a form of coping mechanism with negative outcome. Schizophrenic patients also get high scores on measures of dissociation. By comparing symptoms and features of DID and schizophrenia, this paper aims to investigate whether cardinal features of schizophrenia can be understood within a trauma perspective. Are there reasons to consider

dissociative processes in the pathology of schizophrenia? Clinical implications for treatment of schizophrenic patients will be discussed.

Method

To address the issue of this paper, relevant literature has been selected based on consecutive searches in the databases Google Scholar, PSYCHinfo, Web of Science, Cochrane, and Oria. The literature searches have included combinations and variations of the keywords; ‘schizophrenia’, ‘psychosis’, ‘childhood adversity’, ‘childhood trauma’, ‘traumatization’, ‘dissociation’, and ‘dissociative identity disorder’.

Dissociative Identity Disorder

Dissociative identity disorder (DID), previously known as multiple personality disorder (MPD), is conceived of as the most complex of the dissociative disorders, and is strongly associated with adverse experiences in childhood (van der Hart et al., 2006). Patients with DID typically report multiple types of interpersonal maltreatment during childhood. This, however, is not a diagnostic criterion.

According to the DSM-V, DID is characterized by “the presence of two or more distinct personality states or an experience of possession” (American Psychiatric Association, 2013, p. 291) and “recurrent episodes of amnesia” (American Psychiatric Association, 2013, p. 291). The different personality states, or identities, in DID are thought to be products of traumatized children’s attempts to compartmentalize overwhelming emotions and memories that are linked to trauma (Merckelbach, Devilly, & Rassin, 2002).

Dissociation is central in DID, and is defined as a lack of the normal integration of thoughts, experiences and feelings into consciousness and memory (American Psychiatric Association, 2013). According to DSM-V, the experience of dissociative

symptoms involves “unbidden intrusions into awareness and behavior” (American Psychiatric Association, 2013, p. 291) that leads to a discontinuity in subjective experience. These intrusions can become manifest as fragmentation of identity, depersonalization, and derealization, and has been referred to as *detachment dissociation* (Vogel et al., 2013), or *positive dissociative symptoms* (van der Hart et al., 2006). Furthermore, dissociative symptoms can involve an “inability to access information or to control mental functions that normally are readily amenable to access or control” (American Psychiatric Association, 2013, p. 291). This latter description of dissociative symptoms includes phenomena such as amnesia for traumatic events, and has been referred to as *compartmentalization dissociation* (Holmes et al., 2015), or *negative dissociative symptoms* (van der Hart et al., 2006).

Within academic terminology, dissociation is often used synonymously with terms such as hysteria, somatization and conversion (Jakobsen, Benum, & Anstorp, 2006). In addition, there are currently numerous and often contradictory definitions of dissociation (van der Hart et al., 2006), causing confusion and making the use of the concept problematic. In this section, the term dissociation is sought clarified and placed in the context of the theory of structural dissociation of the personality (van der Hart et al., 2006) as it relates to the diagnosis DID.

The Theory of Structural Dissociation of the Personality

The theory of structural dissociation of the personality (van der Hart, Nijenhuis, Steele, & Brown, 2004) incorporates classical and contemporary views and theories on dissociation and traumatization.

An individual’s personality is thought to consist of several evolved and adaptive psychobiological *action systems* organized into two major categories that are aimed at

1) approaching attractive stimuli, or 2) avoiding or escaping aversive threats (Nijenhuis et al., 2006; van der Hart et al., 2006). The action systems are functional and flexible within certain limitations. They activate different affects and emotions to help the individual identify its surroundings as either useful or harmful (Nijenhuis et al., 2006) and to generate adaptive responses to the surroundings (van der Hart et al., 2006).

Van der Hart et al. (2006) propose that dissociative divisions take place between the two major categories of action systems. As humans we are not able to engage easily in tasks of daily living and survival simultaneously when under threat. When both categories of action systems are necessary for longer periods of time, for instance in repeated traumatization, a division in personality may develop to cope with the conflicting goals of these simultaneously activated action systems (van der Hart et al., 2006). This division is referred to as basic structural dissociation of the personality. Structural dissociation causes a lack of cohesion and integration of the personality that is manifested in the alteration between, and coexistence of, re-experiencing and avoiding the traumatic memories (van der Hart et al., 2006).

Structural dissociation involves different parts of the individual's personality (Nijenhuis et al., 2006). The *apparently normal part* of the personality (ANP), is fixated in trying to go on with normal life, and is directed by action systems for daily life such as exploration, caretaking, and attachment, while avoiding the traumatic memories. Other parts of the personality, referred to as *emotional parts* (EP), are fixated in the action system that was activated during the traumatic event (e.g., action systems for defense or sexuality).

According to the theory, structural dissociation can range from very simple to extremely complex divisions of the personality. It is the patient's *one* personality that is

split into two or more parts (Nijenhuis et al., 2006). Therefore, structural dissociation must be understood as a dimensional construction that affects the whole personality. The most basic form of division is *primary structural dissociation*, which involves a division between a single ANP and a single EP. When traumatizing events are increasingly overwhelming or prolonged, further division of EP may occur, while a single ANP remains intact. This is referred to as *secondary structural dissociation*. When inescapable aspects of daily life become associated with past trauma, triggers tend to reactivate traumatic memories, and a division of the ANP may occur in addition to divisions of EP. This is the most complex form of structural dissociation, and is referred to as *tertiary structural dissociation*. Tertiary structural dissociation occurs when early and chronic traumatization stands in the way of the development of a relatively coherent personality (Nijenhuis et al., 2006). An integrated personality is achieved through development. Traumatized children rarely have developed an integrated personality prior to traumatization. Therefore, the traumatization disrupts the normal development and integration of the personality. The complex levels of tertiary structural dissociation in adults who were chronically traumatized as children were developed within a personality that lacks the normal cohesion and coherence of the mental system (van der Hart et al., 2006).

The theory's basic premise is that all trauma-related disorders involve some degree of structural dissociation, with acute stress disorder and simple posttraumatic stress disorder (PTSD) being the most basic, and DID the most complex, involving tertiary structural dissociation (van der Hart et al., 2006).

Controversies Surrounding Dissociation

DID has been of importance throughout the history of psychiatry (Dorahy et al., 2014), and is recognized as a mental disorder in the DSM-V. In spite of this, theory and research on dissociation in general, and on DID in particular, has been characterized by controversy and debate surrounding its validity, prevalence, and etiology (Dalenberg et al., 2012; Dorahy et al., 2014; Floris & McPherson, 2015; Merckelbach et al., 2002).

In an overview, Dorahy et al. (2014) examined the empirical data on DID. They found that DID is a valid diagnosis that can be reliably discriminated from other disorders by the use of diagnostic instruments.

The debate about the etiology of DID has focused on whether childhood trauma can cause psychopathology. The debate connected to false memories of trauma is of importance in this controversy. Critics to DID view the disorder to be iatrogenic and caused by a combination of overly committed therapists and highly suggestible patients (Floris & McPherson, 2015). The false memory debate contributed to more research on the relationship between trauma and dissociation, and to the findings that dissociation was related to more severe forms of trauma-related syndromes, such as complex PTSD (Allen, Huntoon, & Evans, 1999). It also became evident that dissociative symptoms were present in syndromes not initially thought to be related to trauma, such as schizophrenia (Dalenberg et al., 2012).

Two models explain the relationship between trauma and dissociative symptoms. Within the *Trauma Model of Dissociation* traumatic experiences are thought to cause dissociation (Dalenberg et al., 2012). Dissociation is assumed to be a coping mechanism that is adaptive when the trauma occurs. This, however, has negative side effects later in life, because non-integrated traumatic experiences tend to intrude into consciousness (Nijenhuis et al., 2006).

In the *Fantasy Model of Dissociation*, dissociation is assumed to be unrelated to trauma, and fantasy proneness is thought to give rise to both dissociative experiences and self-reports of traumatic experiences (Dalenberg et al., 2012). Fantasy proneness refers to a deep and profound involvement in fantasy and imagination (Merckelbach & Muris, 2001), and is related to the concept of absorption. Absorption is defined as “a disposition for having episodes of ‘total’ attention that fully engage one’s representational resources” (Tellegen & Atkinson, 1974, p. 268). The tendency for fantasizing is acknowledged within the Trauma Model, and is explained as a strategy to escape from a hurtful reality in traumatized patients. However, it is not believed to cause dissociation (Näring & Nijenhuis, 2005).

In a meta-analysis of both the models, the findings suggest a strong and consistent relationship between trauma and dissociation that appears reliably across studies both in clinical and community samples (Dalenberg et al., 2012). In line with this, Dorahy et al. (2014) found that almost every individual with DID in the studies they examined had a history of severe, chronic childhood trauma.

In summary, despite controvercies and debate surrounding DID, accumulating research supports DID as a complex and valid diagnosis with a strong association to childhood adversities.

Schizophrenia

Schizophrenia is characterized as a psychotic disorder (American Psychiatric Association, 2013). Psychosis is considered a generic psychiatric term for “a loss of contact with reality, including false ideas (delusions) and sensory experiences without objective origin (hallucinations)” (Longden et al., 2012, p. 29). The psychotic disorders in DSM-V are defined by abnormalities in one or more of the following five domains:

delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behavior, and negative symptoms (American Psychiatric Association, 2013). To obtain a diagnosis of schizophrenia a person has to experience at least two of these symptoms for more than a month (American Psychiatric Association, 2013).

Delusions refer to false beliefs that are not consistent with, or accepted within, the persons's culture (National Institute of Mental Health, 2016a). Hallucinations refer to perceptions that occur in the absence of external stimuli (Silbersweig et al., 1995). Disorganized speech concerns disturbances in how a person's thoughts, expressed through speech, comply with language. The listener does not understand the person's discourse (McGrath, 1991). Disorganized behavior refers to behavior that is unusual for the individual and may seem strange and inappropriate. Such behaviors can for instance be repetitive behavior, unexpected violence, or aimless wandering (Bakken, Eilertsen, Smeby & Mertinsen, 2009). The negative symptoms include flattened affect, reduced experience of joy, and difficulties initiating and sustaining everyday activities including speech (National Insitute of Mental Health, 2016b). Disturbances in self-experience also seem to be an important feature of schizophrenia (Sass & Parnas, 2003; Sass, Pienkos, Nelson, & Medford, 2013; Scharfetter, 2008).

The Etiology of Schizophrenia

There have been descriptions of, and several different etiological explanations for, schizophrenia for more than 100 years (Adityanjee, Aderibigbe, Theodoridis & Vieweg, 1999). From early to the mid-1900s the importance of early experiences with caregivers was emphasized in the development of schizophrenia (Shean, 2004).

In the 1950s, with the discovery of neuroleptic drugs, research on schizophrenia began focusing on brain chemistry. Dopamine and glutamate systems in the brain have

been thought to be of relevance (Coyle, 2006; Insel, 2010). Even though activity in both dopamine and glutamate systems in the brain seem to be involved in the pathology of schizophrenia, it has not been proved that either system is causing the disorder. Some critics have argued that the neurochemical deficits could be an effect of chronic illness or of the treatment, and thus do not represent a causal factor (Insel, 2010).

Several environmental factors contribute in the development of schizophrenia (Mäki et al., 2005). Some studies show that maternal malnutrition during pregnancy, infections during second trimester, and cytokine exposure is associated with later development of schizophrenia. However, most of these effects are modest (Insel, 2010). Living in urban areas during childhood and adolescence, having a history of migration, and male gender all seem to be associated with increased risk for developing schizophrenia (Mäki et al., 2005). In addition, some studies have indicated that premorbid cannabis use is associated with development of schizophrenia (Arseneault, Cannon, Witton, & Murray, 2004).

Several studies have demonstrated a high heritability estimate of schizophrenia (Cardno et al., 1999; Forero et al., in press; Kendler et al., 1993; Sullivan, Kendler, & Neale, 2003). In genetic research, several genes have been identified that may be involved in the development of the disorder. These genes are implicated in brain development, and schizophrenia is now recognized as a neurodevelopmental disorder (Insel, 2010).

Neurodevelopmental models present a framework for integrating both genetic and environmental factors in the development of schizophrenia. These models propose that the substrate of schizophrenia is established when development fails and key neural networks do not develop normally (Tsuang, Stone, & Faraone, 2001).

Childhood Adversities as Potentially Traumatizing Events

Childhood adversities, such as sexual or physical abuse, emotional abuse, and emotional neglect, appear to play an etiological role in the development of adult psychopathology (Evans et al., 2015; Read et al., 2005; Schalinski et al., 2015). Early adverse experiences can be traumatizing in their effects on individuals. Furthermore, the child often experiences these kinds of adversities in combination with lack of emotional and social support (van der Hart et al., 2006).

Trauma is defined as a psychobiological injury that is caused by an event that exceeds the individual's capacity to mentally integrate it (Nijenhuis & van der Hart, 2011). Extremely stressful experiences, such as childhood adversities, can be conceived of as *potentially traumatizing events*, as not everyone who experiences it will necessarily be traumatized.

Several factors increase an event's potential to be traumatizing (van der Hart et al., 2006). These factors include 1) sudden, uncontrollable, unpredictable, and extremely negative experiences, 2) interpersonally violent and physically harmful or life threatening events, and 3) experiences that involve attachment loss or betrayal by an important attachment person. According to van der Hart et al. (2006) child abuse often includes all of these factors, making it highly likely to be traumatizing.

Although the term trauma was initially defined as the damage caused by an isolated incident or a single traumatic experience, it is also of relevance to long lasting, repeated exposure to stress (Benum, 2006). Recurrent exposure to major stressors over time has been termed *chronic traumatization* (van der Hart et al., 2006). In chronic traumatization, there is an accumulation of the harmful effects to the individual that will have pervasive consequences, especially when occurring at an early age (Benum, 2006).

Furthermore, chronic traumatization impacts both mental and physical functions because the development of the brain and neuroendocrine function are compromised (van der Hart et al., 2006). Early and repeated traumatization from close caregivers undermines the individual's ability to use its relations to others for the establishment of safety. It affects the individual's ways of perceiving, thinking and relating to itself and its environment, and interrupts the development of personality and alters the self-concept (Benum, 2006).

Physical and sexual abuse has received most attention in research on childhood adversities (Benum, 2006). However, it has become evident that chronic traumatization can also occur as a response to other adverse experiences, such as emotional abuse, emotional neglect, and lack of social support (Benum, 2006). *Emotional abuse* refers to psychological maltreatment and non-physical aggression (Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003), and can involve caregivers that actively or passively reject, ignore, or continuously criticize the child (Benum, 2006). *Emotional neglect* refers to the absence of a nurturing emotional environment (Spertus et al., 2003), and involves caregivers that are nonresponsive to their child's need for warmth and comfort. Emotional abuse and neglect thus involve depriving the child of aspects that are vital for the psychological development (van der Hart et al., 2006). Among the long term effects of emotional neglect are difficulties in self-soothing and affect regulation (Benum, 2006). Social support is important because children are dependent on adults for help in integrating difficult experiences. Therefore, *Lack of social support* constitutes a risk factor for the development of trauma-related disorders in the face of early and chronic traumatization (van der Hart et al., 2006).

Throughout this paper the term childhood adversities is used to encompass all of the above discussed kinds of potentially traumatizing events in childhood.

Early Relational Experiences and Disorganized Attachment

Both in schizophrenia and in DID, early relations to significant caregivers have been acknowledged as important contributors to the development of psychopathology (Cannon, Caspi & Moffitt, 2002; Liotti, 2004). One view on this contribution is based on the development of a *disorganized attachment system* after a child is exposed to potentially traumatizing events from significant others (Liotti & Gumley, 2008).

John Bowlby (1969) pointed to attachment as an adaptive system that is activated in response to fear. The activation of the system motivates the child to seek proximity to the caregiver, with the expectation that they will receive protection and emotional support.

These early experiences and expectations of interaction gradually become internalized in the child (Bowlby, 1969), and are carried forward into childhood and adulthood as implicit core relational schemata (Liotti & Gumley, 2008). These relational schemata, or *internal working models* (Bowlby, 1969; Mercer, 2006), regulate cognitive, behavioral and affective responses in interpersonal interactions and produce enduring expectations about the self and others (Liotti & Gumley, 2008; Mercer, 2006). Based on the response they receive from their caregivers, infants develop different organized patterns of attachment behavior toward their caregivers (Ainsworth, Blehar, Waters & Wall, 1978). A specific internal working model corresponds to each of these patterns (Liotti & Gumley, 2008).

Ainsworth et al. (1978) identified three *organized* patterns of attachment; secure, avoidant and resistant (or ambivalent). Each of these patterns seem to be related to the

experienced and expected interaction with a caregiver (Ainsworth et al., 1978; Main, 1995), in which the child has received varying degrees of accessibility and sensitivity from the caregiver for its signals and needs (Ainsworth et al., 1978). Some children seem to lack any organized or coherent attachment pattern when the attachment system is activated (Main, 1991; Main & Solomon, 1986). In response to the caregiver, these children show conflicting, disoriented, and contradictory behavioral patterns; their attachment patterns are *disorganized* (Liotti & Gumley, 2008; Main, 1991).

The conflicting responses are thought to be a result of frightening caregiver behavior (Main, 1995), thus interfering with the development of a coherent pattern of attachment (Liotti, 2004). In the presence of any stressor, the child seeks proximity to the caregiver for safety, comfort, and reassurance (Blizard, 2003; Bowlby, 1969; Holmes, 2004). Disorganized attachment arises when a child is unable to form any coherent strategy for maintaining attachment to a parent or other significant caretaker, because the caretaker is unable to provide safety or threatens the child (Blizard, 2003).

Disorganized attachment behavior represents an approach-avoidance dilemma (Holmes, 2004), in which the attachment figure itself is the source of threat. The origin of disorganized attachment behavior has been explained in terms of conflict between two different inborn systems; the attachment system and the fight-flight system (Liotti & Gumley, 2008), two systems that normally operate in harmony. These children are put in an inextricable situation where they are caught in a relational trap, the caregiver is the source of the experience of fear (which activates the fight-flight system), and is at the same time the solution to the child's fear (which activates the attachment system) (Hesse & Main, 2000; Liotti & Gumley, 2008). This situation has been termed *fright*

without solution (Main & Hesse, 1990). No consistent behavioral strategy will relieve the threat (Holmes, 2004).

Liotti (2004) argues that disorganized attachment may be the starting point for the development of dissociative disorders. This is because the fright without solution situation demands that the child dissociate the painful experience to maintain a relation to the caregiver, which the child is dependent on. It has been suggested that disorganized attachment also may be involved in the development of schizophrenia, and that disorganized attachment thus represents a common developmental route in both disorders (Liotti & Gumley, 2008).

Childhood Adversities in DID

DID is highly associated with childhood adversities (Foote et al., 2006; Mulder et al., 1998; Ross et al., 1990; Simeon et al., 2001; van Ijzendoorn & Schuengel, 1996). In a meta-analysis, a strong and significant relationship between childhood adversities and dissociative symptoms emerged (van Ijzendoorn & Schuengel, 1996). Subjects that achieve high scores on the Dissociative Experiences Scale (DES) (Bernstein & Putnam, 1986) have been found to report a greater extent of psychological, physical, and sexual maltreatment in childhood, both in clinical (Sandberg & Lynn, 1992) and general population samples (Mulder et al., 1998).

A history of childhood physical and/or sexual abuse was reported in 95.1 % of a sample of patients diagnosed with DID (Ross et al., 1990). Foote et al. (2006) found that 29 % of an outpatient psychiatric sample in the US qualified for a dissociative disorder, and that 6 % of the sample fulfilled the criteria for DID. Furthermore, patients in the sample with a dissociative disorder were significantly more likely to report childhood physical and sexual abuse than patients without a dissociative disorder. A recent study

from Turkey found similar prevalence in an outpatient sample, and replicated the finding that childhood adversities were more common in patients with a dissociative disorder than in patients who did not have a dissociative disorder (Yanartas et al., 2015).

There also appear to be a relationship between severity of trauma (Kirby, Chu, & Dill, 1993; Simeon et al., 2001), lower age onset of the abuse (Kirby et al., 1993; Schalinski & Teicher, 2015), and the severity of dissociative symptomatology. This lends further support for childhood adversities playing a causal role in dissociative processes. Severity of dissociative symptoms has been shown to be related to number of childhood, but not number of adult, traumatic events, indicating that there may be windows of vulnerability for the development of dissociation (Schalinski & Teicher, 2015).

Childhood Adversities in Schizophrenia

Several studies have shown a high prevalence of different types of childhood adversities among patients with schizophrenia (Bendall et al., 2008; Morgan & Fisher, 2007; Ross & Keyes, 2004; Sar et al., 2009; Schalinski et al., 2015; Spence et al., 2006). Spence et al. (2006) found that 75 % of patients in a schizophrenia sample had experienced one or more childhood adversities. Furthermore, the study indicated that physical abuse was related to schizophrenia to a larger extent than to other non-psychotic disorders. In line with the findings of Spence et al. (2006), Schalinski et al. (2015) found that 73 % of a sample with psychotic spectrum disorders, of which the majority (77,4 %) filled the criteria for a diagnosis of schizophrenia, reported at least one childhood adversity. A meta-analysis yielded similar prevalence numbers (Matheson, Shepherd, Pinchbeck, Laurens, & Carr, 2013).

Early childhood adversities increase the risk for positive psychotic symptoms (Janssen et al., 2004; Read, Agar, Argyle, & Aderhold, 2003; Schalinski et al., 2015; Schenkel, Spaulding, DiLillo, & Silverstein, 2005) such as delusions and hallucinations (Muenzenmaier et al., 2015). Schalinski et al. (2015) investigated the impact of different types of childhood adversities on symptom severity and course of illness in a sample of patients with psychotic spectrum disorders. Patients with high levels of childhood adversities expressed more positive symptoms than patients with low levels of childhood adversities, and also reported an overall higher symptom expression. The results indicate that emotional neglect and physical neglect, along with sexual abuse, have an impact on the severity of the symptoms. Emotional neglect predicted positive symptoms (Schalinski et al., 2015).

In line with these findings, it has been suggested that childhood adversities, such as physical and sexual abuse, and physical and emotional neglect, may be a causal factor in schizophrenia (Holowka, King, Saheb, Pukall, & Brunet, 2003; Read et al., 2014; Read et al., 2005). However, this relationship between childhood adversities and schizophrenia is subject to debate, and Morgan and Fisher (2007) argue that there is not enough research supporting this link. They and others (Bendall et al., 2008) argue that the findings have methodological limitations such as lack of a control group, and that one should be careful to overinterpret the results. However, a rapidly increasing body of research indicates an association between childhood adversities and schizophrenia, and several studies have aimed to explore the nature of this association (Evans et al., 2015).

Dissociative Processes in Schizophrenic Symptoms and Features

In the following section, the paper elaborates how the positive symptoms of schizophrenia, often referred to as Schneiderian first rank symptoms, can be interpreted

in terms of dissociative processes. Also, memory impairments and disruptions in self-experience in schizophrenia will be considered, as well as how these can be conceptualized within the framework of so-called negative dissociative symptoms, such as dissociative amnesia and depersonalization. It is also common to use the terms positive and negative symptoms to describe symptoms of schizophrenia.

Positive Symptoms

Positive symptoms of schizophrenia are defined as an increase of certain symptomatic experiences and behaviors (Shean, 2004), and encompass the Schneiderian first rank symptoms. Schneiderian first rank symptoms include, but are not limited to, hallucinations, such as voices arguing or commenting, images of traumatic experiences, and delusional thinking (Ellason & Ross, 1995).

Positive dissociative symptoms are defined as “mental and physical or behavioral phenomena that intrude or interrupt one or more parts of the personality, and that represent features of one or more other parts of the personality” (van der Hart et al., 2006, p. 91). In terms of the theory of structural dissociation, positive dissociative symptoms involve intrusion of an emotional part of the personality (EP) into the apparently normal part of the personality (ANP), for instance in the form of intrusive memories or flashbacks (Nijenhuis et al., 2006). Although intrusive memories, or flashbacks, are not commonly associated with dissociation, Nijenhuis et al. (2006) argue that they represent positive dissociative symptoms. According to them, intrusive memories illustrate that the personality is not fully integrated and that parts of the personality are fixated on the traumatic experience(s).

Auditory hallucinations. Auditory hallucinations are defined as a percept-like experience of a human vocalization that appears in the absence of an appropriate

stimulus. It also follows that the voice is experienced in a conscious state and is not induced by organic or state dependent circumstances (Longden et al., 2012). Auditory hallucinations have generally been considered to be a cardinal symptom in psychotic disorders, including schizophrenia (David, 1999). Voices commenting and conversing are a typical characteristic of schizophrenia, but are also common in DID (Moskowitz, Barker-Collo, & Ellson, 2005; Moskowitz, Read, Farrelly, Rudegeair, & Williams, 2009). In fact, some studies have indicated a higher prevalence of auditory hallucinations in DID than in schizophrenia (Ellason & Ross, 1995; Moskowitz et al., 2005; Ross et al., 1990). Furthermore, voice hearing appears to be quite common in the general population with estimates of lifetime prevalence varying from 1-16 %, indicating that voice hearing may not be the hallmark of schizophrenia after all (Longden et al., 2012).

Several attempts have been made to distinguish diagnostically between voice hearing as it appears in DID and schizophrenia, respectively (Copolov, Trauer, & Mackinnon, 2004; Dorahy et al., 2009; van der Hart et al., 2006). One example of this is the notion that voice hearing differs in perceived location of the voices. In this view, voices in DID are believed to be experienced as originating from within the person (i.e., ego-syntonic) and as originating externally in schizophrenia (i.e., ego-dystonic) (Longden et al., 2012; Moskowitz & Corstens, 2008). However, research has not supported this assumption, indicating that a differential diagnosis based on characteristics of voice hearing is of limited validity (Copolov et al., 2004; Moskowitz & Corstens, 2008).

Dorahy et al. (2009) investigated differences and similarities in voice hearing in three groups of patients. They compared one group of schizophrenia patients without a

history of childhood adversities, one group of schizophrenia patients with experience of childhood adversities, and a third group of patients with DID. The DID sample was more likely than both schizophrenia samples to experience voice hearing before the age of 18, to hear more than two different voices, and to experience both child and adult voices. The DID group also had a higher incidence of tactile and visual hallucinations than the schizophrenic groups (Dorahy et al., 2009).

Van der Hart et al. (2006) argue that voices heard by patients with a dissociative disorder are different from those in schizophrenic patients. The voices in DID are relational because they are thought to represent different parts of the patient's personality, and they are believed to be able to engage in conversations with other parts of the personality, or with the therapist. Voices in schizophrenia appear to be more fixed and repetitious than in DID (van der Hart et al., 2006). Tentative support for this view comes from the study of Dorahy et al. (2009). They found that patients with DID were more likely than schizophrenic patients to report voices conversing with them, and 70 % of the DID patients reported that they would miss the voices if they disappeared. In contrast, only 20 % of the patients with schizophrenia reported that they would miss their voices. The results indicate that voice hearing is more integrated in the identity of patients with DID compared to patients with schizophrenia (Dorahy et al., 2009). The finding that most of DID patients would miss their voices if they disappeared, is in line with van der Hart et al.'s (2006) notion of DID voices as more relationally engaging.

A new understanding of the relationship between auditory hallucinations in schizophrenia and DID has emerged from studies of dissociative processes in the etiology of voice hearing. Dissociative processes have been suggested to operate as a mediating factor between childhood adversities and voice hearing (Moskowitz &

Corstens, 2008; Pilton, Varese, Berry, & Bucci, 2015; Varese, Barkus, & Bentall, 2012). Van der Hart et al. (2006) explain the mediating role of dissociative processes according to the model of structural dissociation. The contents of the hallucinations are thought to reflect aspects of the traumatic event, i.e., the voice of the perpetrator. The dissociative (i.e., non-integrated) nature of traumatic experience (e.g., childhood adversities) makes patients experience its content as ego-dystonic, as not originating from their own experience. According to this model, voice hearing results from dissociative parts (EPs) that intrude into conscious awareness (ANP). As the patients have no recollection of having experienced the traumatic event when they are in the state of ANP, they might interpret the intrusion of EP as voices originating from external sources e.g. auditory hallucinations (van der Hart et al., 2006). This explanation contradicts the assumption of voices originating internally, or ego-syntonic, in patients with DID.

Voice hearing in schizophrenia and DID appear similar, and a substantial proportion of the normal population appear to experience voice hearing. Therefore, several researchers consider voice hearing as a dissociative experience, which under some conditions could have pathological consequences (Copolov et al., 2004; Moskowitz & Corstens, 2008).

Delusions. Delusions refer to culturally inappropriate beliefs about external reality that is firmly held by the patient, often in the face of contradicting proof (Moskowitz et al., 2009).

Examples of delusions are seen in delusions of thought withdrawal, which refer to the belief that thoughts are being removed from the person by some external force. They also include delusions of thoughts being placed in the patient's mind (i.e., thought

insertion), and delusions about the body being controlled by an external force (i.e., delusion of control). These delusions are characteristic of schizophrenia, but it seems that at least two thirds of patients with DID also experience one of these symptoms (Ross, Heber, Norton, & Anderson, 1989; Ross et al., 1990). It has been suggested that dissociative processes contribute to the experience of delusions in both schizophrenia and DID (Goff, Brotman, Kindlon, Waites, & Amico, 1991; Moskowitz et al., 2005).

Interesting findings come from a study that investigated dissociation in a sample of schizophrenic patients with delusions of possession, a delusion of control (Goff et al., 1991). Results revealed that patients with this delusion scored significantly higher on measures of dissociation and also had higher levels of self-reported childhood trauma than schizophrenia patients without delusions of control. This finding supports the role of dissociative processes in delusions in some patients with schizophrenia. Moskowitz et al. (2009) argue that in DID, delusions are caused by the intrusion of an EP, which the ANP experiences as foreign. The ANP interprets the intrusion as the influence of an external force, and this is thought to cause delusional explanations for the event. This underlying dissociative process, similar to that proposed for explaining auditory hallucinations, could be assumed to contribute to delusions in some schizophrenic patients (Moskowitz et al., 2009).

Disorganized and catatonic behavior. Behavior is typically considered disorganized if others do not understand it. However, lack of understanding does not mean that the behavior is meaningless. Both patients with DID and schizophrenia that have a history of childhood adversities can experience flashbacks that can make them behave as if the traumatic situation is happening in the present (Read et al., 2005). If

others are not aware of the trauma-history, it is likely that this kind of behavior will be interpreted as disorganized, and therefore, psychotic (Moskowitz et al., 2009).

Similarly, it has been suggested that catatonia might reflect flashbacks to traumatic experiences in childhood (Moskowitz et al., 2009). In this view, catatonia is understood as a fear response in which the identity state that remembers the traumatic event intrudes into conscious awareness. This part of the personality is terrified and causes the body to freeze. These flashbacks will sometimes be unconscious as the event took place at an early time of life, when the memory system was not fully developed. Therefore, the memory of the traumatic event is not consolidated in the individual's autobiographical memory; it is implicit and decontextualized (Moskowitz et al., 2005; Moskowitz et al., 2009). This represents an alternative interpretation of disorganized and catatonic behavior. Although catatonia is generally considered to be a negative symptom, it can be conceived as a positive dissociative symptom; as an expression of unresolved trauma and non-integrated memories.

Negative Symptoms

The negative symptoms of schizophrenia refer to an absence of normal behavior, and include social withdrawal, apathy and cognitive impairments (Buchanan, 2007). Negative dissociative symptoms are defined as “mental and physical phenomena that are not available to one or more parts of the personality, but are available to others” (van der Hart et al., 2006, p. 91). Such symptoms include dissociative amnesia, numbing, and depersonalization, among others. These symptoms have also been found in schizophrenic patients with a history of childhood adversities (Moskowitz et al., 2009). These definitions resemble each other in that they both refer to something that is missing or is unavailable to the individual.

Memory impairments and dissociative amnesia. Memory impairments are well documented in schizophrenia (Moskowitz et al., 2009). The general finding is that implicit memory appears to be intact, while explicit memory is impaired (Achim & Lepage, 2003; Corcoran & Frith, 2003; Linscott & Knight, 2001; Marie et al., 2001). A similar pattern in memory impairment have emerged in DID patients. In a meta-analysis of studies on memory dysfunction in DID, Dorahy (2001) concludes that research supports amnesia between different identity states regarding explicit knowledge, whereas there appears to be some transfer of implicit knowledge between identity states.

Dissociative amnesia is defined as one or more episodes in which the individual is unable to remember important personal information, usually of traumatic or stressful character (Jakobsen, 2006). It occurs in varying degrees in patients with DID (Dell, 2002; Dorahy, 2001) and implies a structural dissociation of the personality; the information may be available to one part of the personality, but not to another part (van der Hart et al., 2006). Thus some form of impairment in explicit memory have been found for both schizophrenia and DID. Memory impairments in DID are explained in terms of dissociative processes, and it has been suggested that similar processes may be at play in schizophrenics with a history of childhood adversities (Moskowitz et al., 2009). In line with this, Danion, Rizzo & Bruant (1999) have argued that the impairments in explicit memory demonstrated by schizophrenic patients arise from problems with combining all aspects of an event into a cohesive entirety. This resembles the un-integrated nature of memories of traumatic events in DID patients, and thus the impairments in explicit memory displayed by schizophrenic patients may be interpreted as a dissociative process.

Schizophrenic patients with impairments in explicit memory display more positive symptoms than patients without such memory deficits (Brébion et al., 1999; Vaz & Heinrichs, 2002). The positive symptoms most often associated with memory impairments in schizophrenia are delusions and thought disorder (Moskowitz et al., 2009). Moskowitz et al. (2009) argue that the dissociative symptom of depersonalization underlies delusions and thought disorder in schizophrenia, and is mediated by impairments in memory.

Disordered self-experience, ipseity disturbance, and depersonalization. The self is defined as “a mental capacity that allows an animal to take itself as the object of its own attention and to think consciously about itself” (Leary & Tangney, 2003, p. 6). The self is involved in people’s experience of themselves, their perceptions, thoughts and feelings about themselves, and their deliberate efforts to regulate their own behavior (Leary & Tangney, 2003). Together, all these mental functions contribute to the individual’s self-experience while being awake and conscious. A healthy self-concept means that the individual has a perception of itself as “a coherent and consistent living subject with a stable but flexible personal identity, delimited from others and able to integrate and control one’s own thinking, feeling, perceiving and acting” (Scharfetter, 2008, p. 52).

In DID, the personality and the self are organized by withdrawal and division (Benum, 2006). The dissociated parts of the personality have their own schemas, reactions and language. The patient’s personality is split into two or more parts, corresponding to innate psychobiological systems that attend to different functions (Nijenhuis et al., 2006). Personality, in this context, refers to a persistent pattern of perception, relations, and thinking about oneself and the environment (Benum, 2006),

and resembles the definition of self as the ability to self-reflect. Benum (2006) compares the self to a center for personal narrative operations, and describes the self as the connection between the ‘autonomous me’ and its attachment to its surroundings. In DID, the self-perception is disjointed and lacks narrative coherence, which leads to confusion about identity (Benum, 2006).

The concept of ‘self’ has a long history within the field of psychosis (Evans et al., 2015), and several authors have proposed that schizophrenia can be understood as a fragmentation of the self or a self-disorder (Sass & Parnas, 2003; Sass et al., 2013; Scharfetter, 2008). Abnormalities in the self or self-experience are not part of the diagnostic criteria for schizophrenia in DSM-V. However, the disorder involves marked changes in the individual’s experience of subjectivity, and altered self-experience often occur in classical accounts of schizophrenia (Sass et al., 2013). According to Bleuler’s description (as cited in Moskowitz, Nadel, Watts, & Jacobs, 2008), schizophrenia always involves a splitting, or fragmentation, of the self. It has been proposed that varying degrees of disrupted self-experience is the common factor in all the schizophrenic syndromes (Scharfetter, 2008).

Sass and Parnas (2003) propose that the core feature of schizophrenia is an ipseity disturbance. Ipseity can be conceived of as a form of ‘minimal self’ that is normally implicit in every act of awareness (Sass et al., 2013). It refers to the experience of being an experiencing subject with a first person perspective on the world (Sass & Parnas, 2003).

The ipseity disturbance described by Sass and Parnas (2003) involves two fundamental and complementary components; *hyper-reflexivity* and *diminishment of self-affection*. Hyper-reflexivity refers to a form of exaggerated self-consciousness in

which a subject experiences itself as a kind of external object. Diminishment of self-affection involves a diminishment of the sense of basic self-presence where the implicit sense of existing as a vital and self-possessed subject of awareness is affected. The disturbance of ipseity thus disrupts the individual's sense of being an experiencing subject, or self, oriented towards objects and the external environment (Sass et al., 2013). The component processes in Sass et al.'s (2013) ipseity disturbance may in some cases resemble the dissociative symptom of depersonalization.

Depersonalization is generally considered to be a dissociative symptom (Nijenhuis et al., 2006). It is an experience that involves a disrupted integration of self-perceptions with the sense of self, in which the individual experiences a sense of unreality and detachment from themselves (Hunter, Sierra, & David, 2004; Simeon, 2004). Common descriptions of depersonalization include the feeling of watching oneself from a distance, feeling disconnected from one's own thoughts, and feeling emotionally numbed or blunted (Simeon, 2004). This resembles the hyper-reflexivity and diminishment of self-affection described by Sass and Parnas (2003) in that the subject has an experience of being estranged from itself and its surroundings.

Depersonalization is common in traumatized individuals, and dissociative parts of the personality can experience symptoms of depersonalization from each other (van der Hart et al., 2006). One study found that patients with DID reported significantly more symptoms of depersonalization than healthy controls, patients with non-dissociative psychiatric disorders, and patients with other dissociative disorders than DID (Dell, 2002).

Little is known about the prevalence of depersonalization and its role in schizophrenia (Maggini, Raballo, & Salvatore, 2002). One study found

depersonalization to be frequent in a sample of chronic schizophrenics (Maggini et al., 2002). Another study found that depersonalization predicted hospitalization for psychosis (Therman et al., 2014). Møller, Haug, Raballo, Parnas, and Melle (2011) reported that among a cohort of 25 schizophrenic subjects, over 50 % reported experiencing symptoms of depersonalization.

Scharfetter (2008) argues that the fragmentation of the self in schizophrenia is a special form of dissociation, and he places the disorder on the most severe outer point of a continuum along with other ‘non-cohesive’ disorders, such as DID. Sass et al. (2013) also argue in favor of a continuum on which schizophrenia represents the most extreme endpoint. They conducted a study in which they assessed anomalies of self-experience in individuals demonstrating depersonalization, a common feature of DID, and compared these anomalies to the self-experiences of schizophrenics. They found several similarities in disrupted self-experience between patients with severe depersonalization and patients with schizophrenia. Among the similarities were changes in the quality of subjective experience and diminished sense of ownership over one’s thoughts, feelings or bodily sensations (Sass et al., 2013). Despite the lack of delusional elaboration or hallucinatory experience in severely depersonalized individuals, these changes in self-experience resemble the first-rank symptoms of schizophrenia, and involve alterations in how the individual experiences the world, such as changed perception of time and disturbances in attention, that are also common in schizophrenia (Sass et al., 2013).

Despite the similarities in self-experience, Scharfetter (2008) argues that the fragmentation of the self, seen in many schizophrenic patients, is rarely observed in patients diagnosed with DID. He assumes that a highly unstable and fluctuating self, such as that observed in DID, is less disposed to ego-fragmentation, which he argues is

the most severe form of dissociation. This is because the instability and fluctuation in DID prevent the self from fragmentation. In line with this, Sass et al. (2013) also report several differences in self-experience between patients with depersonalization and schizophrenia. In their sample, depersonalized individuals do not appear to experience the same diffusion of boundaries between the self and the world as do schizophrenic individuals. Nor do they have the same tendency for grandiose ideas of controlling or creating the world. Sass et al. (2013) conclude that although the phenomenology of depersonalization includes some similarities to the disordered self-experience seen in schizophrenia, the difference lies in the notion that core features of psychosis are absent in depersonalized patients.

Research has indicated that dissociative processes could be involved in hallucinations, delusions, memory impairments, and disruptions of self-experience, often experienced by patients with schizophrenia (Moskowitz et al., 2005; Moskowitz & Corstens, 2008; Moskowitz et al., 2009). The importance of dissociative processes in schizophrenia is further supported by neurobiological findings demonstrating many of the same alterations in patients with DID and schizophrenia (Read et al., 2014; Read, Perry, Moskowitz, & Connolly, 2001).

Neurobiological Findings

Structural and functional changes in the brain are well documented in research on both trauma and schizophrenia. Neurobiological findings have shed light on the impact of early traumatic experiences on the brain, and accumulating evidence support the notion that childhood adversities can alter the structure and the function of the developing brain (Anda et al., 2006; Weiss, 2007). The parts of the brain that are most sensitive to stress are the same parts that are of importance to survival in situations of

extreme threat (Bremner, 2002). The effects of childhood adversities on the brain involve alterations in specific regions of the brain, modifications in the HPA axis, and changes in neurotransmitter activity in the central nervous system (Weiss, 2007). In general, the neurobiological alterations associated with childhood adversities reflect a dysregulation that result in over- or under-activation of the implicated neural system, which can be linked to symptoms (Weiss, 2007) in schizophrenia and DID.

Neurobiological Findings in People Exposed to Childhood Adversities

Research is accumulating on the neurobiology of dissociative responses in patients with dissociative disorders and PTSD (Dorahy et al., 2014). However, relatively little is known about the neural and psychological developmental processes that underlie DID (Forrest, 2001), and studies that directly target DID patients are still limited (Dorahy et al., 2014). However, it seems reasonable to assume that research conducted on persons that have been exposed to childhood adversities also applies to patients with DID, as traumatization is a central element in the development of the disorder. Much of the research on traumas' effect on the brain at different biological levels is compatible with the theory of structural dissociation of the personality (Jakobsen, 2006). A limited number of studies have investigated the neurobiology of patients diagnosed with DID, and some structural and functional alterations comprising orbitofrontal, cortical-limbic, and temporal areas of the brain are reported (Dorahy et al., 2014).

Brain regions associated with the limbic system are often altered in traumatized individuals (Jakobsen, 2006; Weiss, 2007). The hippocampus, a part of the limbic system, plays a critical role in learning and memory, and is sensitive to stress (Anda et al., 2006; Bremner, 2002). Reductions in hippocampal volume, particularly on the left

side (Read et al., 2014), are the most frequently reported finding in traumatized individuals (Jakobsen, 2006; Vermetten & Bremner, 2002b). Hippocampal activity has also been found to be affected in traumatized individuals, with decreased activation and lower levels of metabolism, especially during active recollection of traumatic memories (Bremner et al., 1999). Such hippocampal deficits may explain memory impairments related to traumatic experiences, for example an inability to remember certain details of the event, fragmentation of the memory, dissociative experiences or complete amnesia for the trauma (Weiss, 2007). In line with this, Vermetten, Schmahl, Lindner, Loewenstein, and Bremner (2006) found smaller hippocampal and amygdalar volume in patients with DID compared to healthy controls.

The HPA axis is the body's major response system for stressful events (Anda et al., 2006; Weiss, 2007). Dysregulation of the HPA axis has been found in people exposed to adverse experiences (Bremner, 2002; Jakobsen, 2006; Weiss, 2007). Early adverse experiences appear to make the HPA axis more sensitive (Gutman & Nemeroff, 2003), leading to excessive secretion of cortisol. In line with this, individuals exposed to adverse experiences have increased cortisol reactivity (Inslicht et al., 2006). When the brain is exposed consistently to high levels of cortisol, such as in prolonged or severe trauma, it becomes sensitized to psychologically threatening stimuli (Weiss, 2007).

Traumatic experiences also affect the activity of several neurotransmitters, partly due to the dysregulation of the HPA axis (Weiss, 2007). Among the neurotransmitters that have been found to be affected by childhood adversities are norepinephrine (Bremner, Krystal, Charney, & Southwick, 1996; Elzinga & Bremner, 2002), serotonin (Bremner, 2002; Matsumoto et al., 2005; Weiss, 2007), and dopamine (Read et al., 2014; Vermetten & Bremner, 2002a; Weiss, 2007). Norepinephrine contributes to

maintain alertness and sharpen focus in potentially dangerous situations, but this system becomes sensitized from repeated activation when the individual is exposed to chronic traumatic stress, adding to the hyperarousal (Bremner et al., 1996). In addition, norepinephrine contributes to strengthening of the neural networks underlying memories associated with the trauma (Elzinga & Bremner, 2002) and may contribute to positive dissociative symptoms such as intrusive memories and flashbacks (Weiss, 2007). Serotonin acts to calm and diminish anxiety in conditions of moderate stress (Bremner, 2005). However, Matsumoto et al. (2005) found that excessive elevation in serotonin levels in rats eventually result in serotonin depletion if the trauma is chronic or persistent. This reduced availability of serotonin then makes it more difficult for the central nervous system to dampen emotional responses to later stressors and may contribute to symptoms of hyperarousal in humans (Weiss, 2007). Higher concentrations of dopamine may impair the individual's capability for sensory processing and have been associated with feelings of depersonalization (Weiss, 2007).

The Traumagenic Neurodevelopmental Model

Differences between the brains of people with a diagnosis of schizophrenia and healthy controls have often been cited in support of the hypothesis that schizophrenia is a brain disease (Read et al., 2014).

Read et al. (2001) noted that there are several similarities between the effects of traumatic events on the developing brain, and the biological abnormalities found in schizophrenic patients. Based on this finding, and findings that indicated a correlation between childhood adversities and schizophrenia, they launched the *traumagenic neurodevelopmental model* (TN) (Read et al., 2001). The TN model facilitates a more integrated approach to schizophrenia, hypothesizing that the high responsivity to stress

in some schizophrenics is caused by “abnormal neurodevelopmental processes originating in traumatic events in childhood” (Read et al., 2001, p. 320). The similarities between the brains of trauma-exposed individuals and patients with schizophrenia include overactivity of the HPA axis, abnormalities in the neurotransmitters dopamine, serotonin and norepinephrine, and structural differences such as hippocampal damage, cerebral atrophy, ventricular enlargements and reversed cerebral asymmetry (Read et al., 2014).

In line with the TN model, decreased hippocampal volume in schizophrenics has been found to be associated with childhood adversity (Hoy et al., 2012). Sheffield, Williams, Woodward, & Heckers (2013) found that prefrontal cortical volume loss was significantly correlated with childhood sexual abuse in a sample of patients with a psychotic disorder. Schäfer et al. (2008) argue that the biological alterations observed in schizophrenic patients such as hippocampal atrophy, may be driven by trauma.

Read et al. (2014) summarized the research published since 2001 on the TN model. One of the studies found that in a sample of patients with schizophrenia, those abused as children had greater HPA axis dysregulation, measured by cortisol levels, compared to their nonabused counterparts (Braehler et al., 2005). The results supported the TN model, and Read et al. (2014) conclude that the etiology of psychosis and schizophrenia is affected by psychosocial factors to the same extent as nonpsychotic disorders.

Despite the documented neurobiological alterations, biological sequelae to childhood adversities are not irreversible (Read et al., 2005). Research has generated optimism about the possibility that neurobiological alterations caused by childhood

trauma may be reversed by means of pharmacological and psychotherapeutic approaches (Weiss, 2007).

A Dissociative Subtype of Schizophrenia

A dissociative subtype of schizophrenia has been suggested in order to explain the overlap in symptoms and features between dissociative disorders and schizophrenia (Ross, 2004). According to Ross (2004) a dissociative subtype of schizophrenia is indicated by the presence of at least three of the following: 1) dissociative amnesia, 2) depersonalization, 3) the presence of two or more distinct identities or personality states, 4) auditory hallucinations, 5) extensive comorbidity, and 6) severe childhood trauma.

It has been estimated that 25-40 % of patients diagnosed with schizophrenia could belong to the dissociative subtype category (Ross & Keyes, 2009; Sar et al., 2009). Ross & Keyes (2004) found an even higher proportion in a sample of individuals in treatment for schizophrenia; 60% of these patients had high scores on measures of dissociation and would fit the dissociative subtype group. Among these patients, Ross & Keyes (2004) found higher prevalence of childhood trauma and comorbidity, in support of Ross' (2004) criteria for the dissociative subtype.

A recent study (Laferrière-Simard, Lecomte, & Ahoundova, 2014) empirically tested Ross' (2004) six criteria in a sample of 50 patients with schizophrenia spectrum disorders. Although the authors contend some scepticism towards the concept of a dissociative subtype of schizophrenia, they found that 24 % of the sample would fit with this category. The researchers suggest modifying the criteria for a dissociative subtype to at least one of the first three criteria (i.e., dissociative amnesia, depersonalization, and

two or more personality states), excluding criteria 4-6 (i.e., auditory hallucinations, comorbidity, and childhood trauma).

The dissociative subtype of schizophrenia is believed to share etiology with other trauma disorders, including DID and PTSD (Schäfer et al., 2008).

Discussion

Early descriptions of schizophrenia are similar to how dissociation is defined and described. Recent research points to childhood adversities being a central factor both in DID, and also in a considerable proportion of schizophrenic patients. Several symptoms characteristic of DID are observed in schizophrenic patients and vice versa (Foote & Park, 2008; Moskowitz et al., 2009), and similarities in neurobiological alterations in response to childhood adversities have emerged (Read et al., 2014). In light of these findings, dissociative processes in schizophrenia have received attention, and a dissociative subtype of schizophrenia has been proposed (Ross, 2004). On this basis, the paper argues that there are reasons to consider dissociative processes in the pathology of schizophrenia, and that this has substantial implications in the treatment of schizophrenia.

Research suggests that positive symptoms of schizophrenia, such as auditory hallucinations, delusions, and disorganized and catatonic behavior, can be conceived of as positive dissociative symptoms. In psychiatry, positive symptoms generally illustrate the schizophrenic mind's disordered ways of thinking and perceiving, and they represent something that is acquired, inconspicuous, and different compared to a non-psychotic mind (Videbech, Kjølbbye, Sørensen, & Vestergaard, 2010). These symptoms have resemblance to what is referred to as positive dissociative symptoms in that there is something that intrudes or interrupts the mind that is different from the mind of a

healthy individual. Within a dissociative approach however, the symptoms are conceived of as something more than evidence for a disease, as the individual's history of trauma is taken into consideration.

About half to three quarters of schizophrenic patients have a history of childhood adversities (Bendall et al., 2008; Morgan & Fisher, 2007; Sar et al., 2009; Schalinski & Teicher, 2015; Spence et al., 2006). These traumatic experiences provide phenomenological meaning to the often assumed meaningless symptoms of these patients, and the symptoms can be interpreted as expressions of unresolved trauma (i.e. dissociation). The positive symptoms displayed by schizophrenics with a history of childhood adversities can be perceived as intrusions of emotional parts of the personality (EPs) into the apparently normal parts of the personality (ANP). In this way the symptoms may become more meaningful and understandable to the patient, and to the therapist.

The fact that schizophrenic patients often display memory impairments provides support for this interpretation. If the patient has a history of childhood adversities, not necessarily available to conscious memory, then flashbacks may resemble, or be interpreted as, hallucinations or delusions. One hypothesis holds that the odd sensations, perceptions, or emotions associated with prodromal, or 'pre-psychotic', experiences derive from early affective experiences, which are not consciously recalled by the individual (Moskowitz et al., 2008). The memories of these experiences are decontextualized, and the authors suggest that delusions may rise from the individual's attempt to make sense of these weird experiences. Decontextualized memories refer to affectively charged memories that lack spatial and temporal context (Moskowitz et al., 2008). Memories of early traumatic experiences may be decontextualized due to

impaired functioning of the hippocampus (information of time and place is not encoded) and potentiated activity of the amygdala (emotional valence is encoded) at the time of the event (Moskowitz et al., 2008). This hypothesis represents a possible explanation of the developmental pathway from childhood adversities to delusional thinking in schizophrenia. The mechanisms inferred in this hypothesis are in line with the assumption that dissociative processes may mediate delusions by means of EPs intruding into ANP. Flashbacks to traumatic experiences that are not integrated in the patient's autobiographical memory are often interpreted as meaningless delusions. This calls for a more trauma-oriented way of interpreting the symptoms of schizophrenia, and such an interpretation may be useful in providing the patient with the tools for understanding and integrating his or her own trauma history.

Both DID and schizophrenia appear to involve some degree of disordered self-experience. However, the altered self-experience differs in certain aspects between the disorders. DID appears to involve more confusion related to own identity, perhaps as a consequence of amnesia for, and depersonalization from, events occurring between different states of consciousness. Schizophrenia on the other hand, seems to involve a larger extent of fragmentation within the self, with insecurity about one's own boundaries and lacking a coherent and consistent 'core'. Despite the differences that have emerged in altered self-experience between dissociative patients and schizophrenics, depersonalization has been found to be present in schizophrenic patients (Møller et al., 2011). The fragmented self of schizophrenic patients resembles depersonalization in DID, and the alterations in self-experience may be placed on a continuum, as proposed by Scharfetter (2008). This could indicate quantitative rather

than qualitative differences between the disordered self-experience of DID patients and schizophrenics.

It has been suggested that an important distinction between DID and schizophrenia is that the ability to reality testing is more intact in patients with DID, compared to schizophrenic patients (Steinberg, 1995). In extension of this, Moskowitz et al. (2009) propose that dissociative processes such as depersonalization, amnesia, and switching to another personality state, enable DID patients to distance themselves from traumatic experiences to a larger extent than schizophrenic patients. Schizophrenic patients, they argue, may be more inclined to form delusional explanations for such experiences. Others have argued that there is no clear difference between DID and schizophrenia when it comes to reality testing abilities, and that both disorders involve difficulties in distinguishing between internal and external reality (Schäfer et al., 2008).

Measured by the Rorschach Comprehensive System, Brand, Armstrong, Loewenstein, and McNary (2009) compared the personality profiles of patients with DID and patients with psychotic disorders. The psychotic sample consisted of patients with different psychotic disorders; the majority (60 %) had schizophrenia. They found that the patients with DID generally had greater capacity for collaborating with others, and for self-reflection, as well as better ability to modulate affect than the psychotic patients. These differences have been used by Moskowitz et al. (2009) to argue that patients with DID are better able to differentiate fantasy from reality than schizophrenic patients.

In addition to the differences in collaborating abilities, self-reflection, and affect modulation, Brand et al. (2009) found similar levels of social misunderstanding among DID and psychotic patients. They argue that although similar, the origin of this

tendency may be different for the two disorders. Patients with DID almost always have a history of inter-relational trauma, often associated with attachment persons. Their ambivalence towards closeness with others may arise from their learned experience that attachment persons are both the source of comfort and terror (Liotti, 2004). Brand et al. (2009) argue that the origin of the tendency for social misunderstanding in psychotic disorders, i.e., schizophrenia, lies in their inability to tolerate closeness with others due to boundary diffusion (Quinlan & Harrow, 1974) and the lack of a 'core' self (Sass & Parnas, 2003). Based on the possible different etiology of social misunderstandings, Brand et al. (2009) argue that this issue should be addressed with different therapeutic interventions in treatment of DID and schizophrenic patients, respectively. However, for schizophrenic patients with a history of inter-relational trauma and attachment experiences such as those inferred in DID, the origin of social misunderstandings may be similar for the two disorders. If this is the case, then schizophrenic patients with a history of childhood adversities may benefit from therapeutic interventions that are similar to those for DID patients to address the tendency for social misunderstandings.

As mentioned previously, it has been proposed that childhood adversities can contribute to the development of schizophrenia via the mediating role of dissociation (Moskowitz, 2011). This mediation can be explained in terms of disorganized attachment (Liotti & Gumley, 2008). Disorganized attachment may evolve as a consequence of repeated fright without flight situations, or chronic traumatization. This form of attachment creates a tendency in the individual to react to later traumas with dissociation and fragmentation of the self (Liotti, 2004). Liotti and Gumley (2008) suggest that this increases the risk for development of disorders that are associated with a fragmented sense of self, such as DID, but also perhaps schizophrenia.

The traumagenic neurodevelopmental model continues to gain support (Read et al., 2014). Early and severe traumatization increases the risk of schizophrenia and psychosis by generating oversensitivity to later emotional stress (Read et al., 2005). In addition, the documentation of similarities in brain alterations between individuals exposed to trauma and schizophrenics is growing (Read et al., 2014). These findings have implications for the treatment of schizophrenia. Read et al. (2014) point out that the neurobiological changes that occur in response to childhood trauma can be reversed. Research has demonstrated that providing a rich environment (Nemeroff, 2004) and psychotherapy (Fuchs, 2004) can reverse some of the consequences of trauma in the developing brain. Furthermore, neurobiological changes have been documented after cognitive behavior treatment of patients with several non-psychotic disorders (Jokić-Begić, 2010). This could be assumed to apply to schizophrenics with a history of childhood adversities as well. Some individuals do not respond to antipsychotic medication and standard care, and Schäfer et al. (2008) have suggested that these individuals could fit Ross' (2004) dissociative subtype of schizophrenia. In line with this, a recent study found that adverse childhood experiences were associated with resistance to antipsychotic medication in a sample of schizophrenia patients (Hassan & De Luca, 2015). This indicates that a subgroup of schizophrenia patients with a history of childhood adversities may benefit from a treatment that incorporates psychotherapeutic approaches to traumatic experiences.

The benefit and validity of introducing a dissociative subtype of schizophrenia has been questioned (Laferrière-Simard et al., 2014). Although they do highlight the need for a larger recognition of dissociation, Laferrière-Simard et al. (2014) argue that the introduction of a dissociative subtype of schizophrenia seems premature, as all

subtypes of schizophrenia have recently been removed from DSM-V due to their lack of validity. Ross (2008) on the other hand, argues that the introduction of a dissociative subtype of schizophrenia is important for increasing the recognition of dissociative symptoms in schizophrenia among clinicians. Furthermore, a dissociative subtype could provide patients with much needed trauma-focused therapy (Ross, 2008).

Bleuler's (as cited in Schäfer et al., 2008) four A's of schizophrenia (i.e., ambivalence, autism, associations, and affect) corresponds to a trauma-dissociation model of schizophrenia (Schäfer et al., 2008). The ambivalence could have its origin in the development of a disorganized attachment system as a response to continuous exposure to fright without flight situations with an abusive caregiver. The autism could be derived from withdrawal to an internal fantasy world in order to escape the horrors of the outside world. Loosening of associations could reflect the thinking of a child-personality state that is fixated in a traumatic memory. The expression of inappropriate affect is possibly due to intrusions from non-integrated memories, causing the affect expressed to not be in line with the present reality. The loosening of associations and inappropriate affect resembles the dissociative processes that have been proposed to contribute to development of positive symptoms (Schäfer et al., 2008). An important implication of this is that some schizophrenic patients may respond to psychotherapeutical approaches to trauma (Schäfer et al., 2008).

The high prevalence of childhood adversities among patients diagnosed with schizophrenia calls for increased focus on trauma history when diagnosing and treating these patients. However, studies have shown a tendency among employees in mental health services to avoid asking patients about childhood adversities (Rossiter et al., 2015), and this tendency is even more profound when the patient has a diagnosis of

schizophrenia (Agar & Read, 2002; Young, Read, Barker-Collo, & Harrison, 2001). A recent study (Read, Sampson, & Critchley, 2016) showed that this tendency is still prevalent in mental health services. Adding to this problem is a lack of updated knowledge about the adverse effects of childhood maltreatment in many textbooks aimed at health professionals (Wilgus, Packer, Lile-King, Miller-Perrin, & Brand, 2016). This indicates that patients with schizophrenia are not asked about experiences of childhood trauma when they receive treatment.

This paper has investigated dissociative processes that might contribute to the pathology of schizophrenia. Following this line of reasoning, psychotherapy aimed at integrating dissociative memories of traumatic experiences could be important in treating schizophrenic patients with a history of childhood adversities. There is an endorsement among therapists working with DID patients of a phase-oriented approach in which the treatment goal is a higher degree of integration of the alter identities of the patient (International Society for the Study of Trauma and Dissociation, 2011). A similar phase-designed treatment has been suggested by Ross (2004) in the treatment of schizophrenic patients with a history of childhood trauma. Promising results were obtained when this treatment was administered to a sample of DID patients, of which 66,7 % met the criteria for schizophrenia or schizoaffective disorder (Ellason & Ross, 1997). Ross (2004) argues that these treatment outcomes lend support for the inclusion of a phase-oriented trauma approach in the treatment of schizophrenic patients with a history of childhood adversities.

It has also been suggested that mentalization-based psychodynamic psychotherapy could be effective in treatment of schizophrenia patients with a history of childhood trauma. Mentalization-based psychotherapy could be valuable in treatment of

self-disturbances in schizophrenia patients with its focus on awareness of the self and others (Brent, 2009). Even though some therapeutic approaches aimed at treatment of childhood traumas in psychotic and schizophrenic patients have gathered promising results, no clear guidelines of how to treat reactions to childhood adversities in patients with a psychotic disorder exist today (Cotter, Kaess, & Yung, 2015).

Conclusion

Some cases of schizophrenia may be understood as a trauma-related disorder, in which the symptoms can be interpreted as meaningful expressions of un-integrated traumatic experiences.

Based on findings of high levels of dissociative symptoms and childhood adversities among many schizophrenic patients, measures of childhood adversities and dissociative symptoms should be integrated in assessment of patients with a tentative schizophrenia diagnosis. Furthermore, it is important to increase knowledge about the possible adverse effects of childhood trauma to health professionals working with these patients. If a trauma history is revealed, trauma-focused treatment should be considered a part of the treatment.

Takk til

Tusen takk til vår veileder Kjersti Arefjord for tett oppfølging og gode råd. Kjersti har vært fleksibel og tilgjengelig for oss gjennom hele prosessen, og vi har fått grundige og raske tilbakemeldinger. Det har vært engasjerende for oss å jobbe med en som har vist så mye entusiasme overfor vårt prosjekt.

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